

# CHAPTER TEN: WATERSHED COORDINATION PROGRAM

## INTRODUCTION

Many of the ecological problems faced by the Tijuana River National Estuarine Research Reserve (NERR) originate in the 1,700-square-mile, binational, Tijuana River watershed -- an area that stretches well beyond the Reserve's borders. While the connections between upstream activities and their effects on Reserve lands can be observed in many locations, the Reserve has no formal authority to influence land use beyond its boundaries.

The Watershed Coordination Program seeks to establish communication and cooperation between the Reserve and other programs, agencies, and governments whose actions influence the long-term health of the Reserve. The Watershed Coordination Plan describes the Reserve's efforts to influence and respond to activities in the watershed and to build partnerships that promote the sustained health of the watershed and the Reserve.

For the 1998-2003 planning period, the Watershed Coordination Program focuses on the sub-watershed known as Goat Canyon (or Cañon de los Laureles). Goat Canyon spans the U.S.- Mexico border in the highly disturbed southern end of the Reserve. It presents a clear example of how upstream factors -- unplanned urbanization, erosion, pollution, and other factors -- have directly generated negative effects on downstream Reserve resources. This plan addresses the most pressing issues at Goat Canyon: slope instability, erosion, sediment control, and storm water management. The Goat Canyon Management Plan and accompanying projects in this sub-watershed will bring the Reserve an important step closer to addressing broader and more complex watershed and bioregional issues in the future.

The location of the Tijuana River watershed is shown in Figure 1. The location of Goat Canyon sub-watershed is shown in Figure 12.

## I. MISSION

The mission for the Watershed Coordination Program is:

**To advance the mission of the Reserve through the strategic development of working relationships with stakeholders and enhanced communication on scientific, cultural, political, and land-use issues in the Tijuana River watershed and the Point Conception to San Quintin bioregion.**

## **II. GOALS**

- Goal 1: Coordinate with watershed stakeholders, agencies, institutions, and representatives to facilitate the Goat Canyon Management Plan and future watershed projects.
- Goal 2: Co-develop and support programs and projects that promote understanding the upstream and downstream interactions.
- Goal 3: Measure the success of projects and intervention through strategic cooperative monitoring and assessment.
- Goal 4: Use and expand the education program developed at the Reserve to educate the general public and decision-makers on the U.S. and Mexican sides in an effort to gain support for future restoration efforts in Goat Canyon and other areas of the Reserve.
- Goal 5: Establish closer linkages with other National Estuarine Research Reserves, National Wildlife Refuges, and other ecological reserves, particularly within our bioregion (Point Conception to San Quintin).
- Goal 6: Maximize protection offered to the Reserve through national and international ecological and coastal special-area designation programs.
- Goal 7: Adequately fund and staff the watershed/binational coordination program.

## **III. POLICIES**

Because watershed-wide planning is a new concept, most agencies have not developed specific policies to address it. This is particularly true for watersheds crossing international boundaries. By nature, a watershed covers many jurisdictions and for this reason, watershed coordination requires compliance with the policies of many managing agencies and other stakeholders scattered throughout the watershed. To effectively work together on watershed initiatives, Reserve managers must initiate communication with these jurisdictions and stakeholders. There are currently no policies at the Tijuana River NERR directing binational watershed management.

## IV. EXISTING CONDITIONS AND PERCEIVED NEEDS

### A. PROGRAM OVERVIEW

Currently, the Tijuana River NERR is managed essentially as an isolated system with few *formal* connections to the surrounding watershed and bioregion. There are limited resources available to analyze these interactions and forge the necessary links that will address, correct, and prevent watershed-derived degradation of the Reserve. While its influences on the Reserve are vitally important, the greater Tijuana River watershed has not been adequately studied due to its sheer size, political complexities, and language and cultural barriers.

Despite these limitations, the Reserve has been successful in building working relationships and collaborations within the watershed, particularly on educational projects. It has also played a role in other institutions' efforts to coordinate diverse partners and needs within the watershed. As these cooperative relationships are formalized, broadened, and better integrated into a Watershed Management Plan, Reserve managers will be better equipped to fulfill their mission of resource protection.

The Tijuana River Watershed Geographical Informational System project, described on page 180, opened the door for greater involvement of and cooperation with Mexican officials (in this case, the Municipality of Tijuana) in watershed planning efforts. To date, the Reserve has sought to expand on those foundation relationships and has worked with Mexican local and federal water agencies on volunteer water quality monitoring. Through the Goat Canyon Management Plan's (see page 182) first binational workshop on sediment control and revegetation, the Reserve has made many more contacts with various agencies (Public Works, Ecology, Education and Social Services) of the Municipalities of both Tijuana and Tecate. Through a second binational workshop and additional future projects, the Reserve will continue to promote Best Management Practices in the region while seeking out opportunities for education and cooperative enhancement, planning and management.

### B. CURRENT WATERSHED COORDINATION PROJECTS

#### 1. The Binational Water Quality Monitoring Program

The binational water quality monitoring program is a watershed-wide project that provides water quality education and awareness for students and teachers on both sides of the border through a hands-on, water quality testing program. By providing an organizing site at the Reserve, the program has sparked numerous projects. The program encouraged local high schools to

base science fair projects on the Tijuana River Estuary and its water, brought water data together with GIS mapping, and created binational exchange days based on shared training in water quality. A new coliform monitoring and educational lab, funded by the San Diego County Water Authority, the National Oceanic and Atmospheric Administration's (NOAA) Estuary-Net, and the California Department of Education, will be part of the broader water quality program.

The binational water quality monitoring program has created closer links between the Reserve and local and state water agencies in San Diego, the San Diego Natural History Museum, and other NERRs involved in similar efforts. The Program has also been successful in building cross-border linkages with the following groups: Proyecto Fronterizo de Educación Ambiental (Border Environmental Education Project), Universidad Autónoma de Baja California (Autonomous University of B.C.), the Commission for Environmental Cooperation, CESPT (municipal water agency of Tijuana), CNA (federal water agency of Mexico), Pro-Esteros, Dirección General de Ecología de B.C. (state agency), secondary schools in Tijuana, teachers, students, and community leaders. These established and growing relationships will prove an invaluable resource for upcoming Goat Canyon watershed planning and restoration efforts.

There is interest on both the U.S. and Mexican side to expand the existing program, including broader monitoring coverage, data and student exchange, and enhanced public education efforts throughout the watershed by way of media events, traveling exhibits, speakers, and other outreach. To move the project forward, an agency or organization in Tijuana must be willing to carry out the Mexican portion of the water quality monitoring program. Such involvement by a Mexican regional agency would increase the program's longevity and effectiveness and enhance the program's practical application. The Reserve currently funds a seasonal position of a watershed coordinator whose primary responsibility is the implementation of this project on both sides of the border.

## **2. GIS System and Watershed Planning**

The Tijuana River Watershed Geographical Informational System (GIS) provides tools for the management of geographical data and sets the stage for cooperative projects in resource management, planning, restoration, and education. The GIS has also established close working relationships with Colegio de la Frontera Norte and the Planning Department of the City of Tijuana. These relationships offer an opportunity for sharing analysis, resources, and relevant sub-watershed information. Sample maps produced by Tijuana River Watershed Project, Watershed Land Use (Figure 16),

Tijuana River Watershed Vegetation Classes (Figure 17), and Watershed Major Sub-basins and Streams (Figure 18) are provided.

The GIS database is a powerful planning tool, but it must be put to use in order to achieve its potential. Researchers at SDSU have used the GIS Tijuana River Watershed database to delineate sub-watersheds and characterize associated land use in these drainage basins. They have connected this data with water quality field sampling to highlight causal relationships and predictor variables for water quality. This land use/water quality model will be a useful tool in Goat Canyon planning efforts, particularly on the Mexican side, where land use has the greatest impact.

### 3. Goat Canyon Management Plan

The Goat Canyon Watershed Management Plan is in its early stages of development. The efforts are being spearheaded by the State Coastal Conservancy and the Southwest Wetlands Interpretive Association (SWIA), with support and input from Reserve staff. The process for development and implementation of the Goat Canyon Management Plan follows.

**TABLE 13: Development and Implementation of the Goat Canyon Management Plan**

| Component  | Task   | Work Product  |
|--|--|---|
| <b>PHASE I:</b><br><br><u>Framing Problems in the Goat Canyon Watershed and Selecting a Solution</u> | Conduct background research  | Short memorandum addressing historic involvement of agencies and organizations in Goat Canyon   |
|  | Inventory resource   | Written assessment of existing conditions, opportunities, and constraints   |
|  | Identify stakeholders  | List of stakeholders in U.S. and Mexico with interest and influence in Goat Canyon  |
|  | Assess needs and priority improvements needed  | Comprehensive list of areas in need of improvement, including but not limited to erosion and sediment control, flood and waste-water control, and habitat restoration |
|  | Identify range of potential solutions  | List of potential solutions to needs identified in the assessment   |
|  | Evaluate solutions and opportunities for stakeholders to contribute in-kind services | Summary of solutions and opportunities for implementation from both the U.S. and Mexican sides  |
|  | Select solutions   | List of priority activities   |
| <b>PHASE II:</b><br><br><u>Implementing</u>  | Design and permit selected solutions   | Implementation plans for each solution  |
|  | Begin implementation   |   |
|  | Complete implementation program  |   |

|  |                            |                                    |
|--|----------------------------|------------------------------------|
| <u>Solutions,</u><br><u>Monitoring,</u><br><u>and</u><br><u>Evaluation</u> |                            |                                    |
|  | Monitor results            | Annual monitoring reports          |
|  | Modify solutions as needed | Annual adaptive management summary |

#### **4. Perceived Needs in Watershed Coordination**

The Reserve does not currently take full advantage of its strategic location on the border, in the center of its bioregion, and at the terminus of a binational watershed. The Reserve would benefit from being better informed about and taking a greater role in related activities currently undertaken and funded by other groups. This might include educational efforts funded by Pro-Esteros (a binational environmental organization) or the San Diego Natural History Museum, watershed research initiatives funded by the U.S. Environmental Protection Agency (EPA), the Regional Water Quality Control Board, San Diego State University, monitoring efforts undertaken by the IBWC, or planning efforts by Tijuana River Valley planning committees.

By keeping in closer contact with other NERRs, NWRs, and organizations of the greater bioregion, the Reserve will benefit in terms of publicity, funding opportunities, shared resources and ideas, and in the exchange of lessons learned here and elsewhere. Indeed, better connections with other organizations and groups in the region would more closely mirror the shared natural links common to migratory animals, pollution flows, urbanization, ocean currents, and broad environmental shifts.

To overcome past deficiencies, address current needs, and take full advantage of existing opportunities, it is critical for the Watershed Coordination Program to expand in the following areas:

1. Monitoring watershed-related projects and planning issues. This includes identifying which groups or agencies are responsible for different developments and changes in land use, assessing positive and negative effects of different projects on the Reserve, and determining how Reserve staff and volunteers might take a role and have a voice in key projects and research. This also includes coordinating with public and private landowners in the Tijuana River Valley in order to enhance project effectiveness and foster cooperative efforts in the south end of the Reserve.
2. Compiling and updating relevant research data that connects Reserve health to the watershed and then making this data accessible to staff, researchers, and project leaders. This would include updating the 1986 GIS database of the Reserve, collecting relevant watershed data from Mexican agencies, compiling water quality data from various sources, and utilizing NOAA-funded researchers to address information gaps.
3. Sharing information on erosion/sediment issues. This includes collecting information on the erosion/sediment process, forming connections with potential partners in Mexico and in the Border Patrol, and formulating an



action plan, project proposals, and funding options for restoration work and sediment prevention.

4. Tackling pollution issues. The program could establish and publicize the negative effects on the Tijuana River Estuary of sewage, industrial waste, street runoff and trash. It also could investigate where effort, education, public information meetings, and future funding might be most effectively applied, and then formulate project proposals and funding options for research, clean-up, restoration, and prevention.
5. Assessing immigration issues. Continue to work with Border Patrol and other interests north and south of the border on how best to avoid negative effects on natural resources associated with undocumented immigrants and Border Patrol activities. The nature and location of impacts from immigration in the Tijuana River Valley have changed in recent years. As a result, the impacts caused by immigrants crossing through and damaging critical wetland habitat have diminished. However, immigration to *Tijuana* from other parts of Mexico, or from other countries, is still a problem for the Reserve. Squatters' villages, all lacking sewage service, continue to expand on the eroding hillsides of Tijuana Watershed canyons. They present a challenge for the Reserve in terms of erosion/sedimentation, water quality concerns, and trash washed down with rain runoff. Better coordination with Mexican agencies on Goat Canyon and future projects will enable the Reserve to take positive steps toward confronting this situation.
6. Focusing on the bioregion. Expand research and form connections with others involved in natural resource management, other ecological reserves, and regional preservation agreements.

To expand this program, additional funding is needed. It also requires better coordination, awareness, and efficient use of resources. Beyond available funding from the operating agencies and from NOAA, possible funding sources to carry out elements of the Watershed Coordination Plan are the EPA, Border 21, Commission on Environmental Cooperation (CEC), Border Environment Cooperation Commission (BECC), Border Patrol, the Port District, California Department of Education, Cal Trans, State Parks Foundation, State Coastal Conservancy, and private foundations.

## **V. PLAN OF ACTION**

**Goal 1. Coordinate with watershed stakeholders, agencies, institutions, and representatives to facilitate the Goat Canyon Management Plan and future watershed projects.**

Objective 1a: Target priority problems within Goat Canyon and the Reserve affected by activities in the watershed.

Tasks:

- Using existing data sources, prepare maps of baseline geomorphic, hydrologic, biologic, and land-use data. Prepare additional graphic materials to assist in illustrating watershed conditions, problem areas, and alternative treatment approaches.
- Assemble a list of problematic issues -- including erosion/sediment, pollution, and trash -- and their respective potential watershed-based causes, including both physical and social parameters. Identify existing sources for this information (GIS, SDSU and PERL data, Coastal Conservancy, consultant reports, etc.).
- Objective 1b: Identify the potential sources of Goat Canyon and Reserve impacts and begin working with U.S. and Mexican watershed stakeholders, agencies, and institutions positioned to help create solutions.

Tasks:

- Conduct meetings with stakeholders to develop agreements on project parameters, goals and objectives, and specific project recommendations. Identified stakeholders include U.S. and Mexican local and binational government officials, environmental and education organizations, and Tijuana Valley recreational advocates. A minimum of two meetings will be binational with English/Spanish translation.
- Review existing technical data, analyze discrete problems, and make recommendations for alternative project components and conceptual construction designs.
- Encourage estuary visits and meetings with stakeholders and key watershed players to begin discussing relevant issues. Encourage new (binational) research on these issues.

Objective 1c: Formally establish connections with relevant stakeholders, agencies, and institutions and allow for their representation and collaboration in Goat Canyon and other Reserve projects. Encourage their interest in the shared watershed and in the Reserve as a resource to all.

Tasks:

- Convene a joint planning meeting with the U.S. EPA Border Environmental Program and the San Diego Regional Water Quality Control Board to take stock of current initiatives and opportunities for collaboration.
- Assemble a roster of stakeholders concerned with binational aspects of the watershed.
- Offer the Reserve as a research and public education resource to watershed-wide user groups.
- Establish regular communication, via newsletter, e-mail, or other means, with watershed stakeholders, institutions, and agencies. Keep these contacts informed of activities and request their input and cooperation.

Objective 1d: Issue a report addressing Goat Canyon problems identified by stakeholders.

Task:

- Prepare a final report with recommended solutions and designs to counter problems stakeholders identified at Goat Canyon. Include unit cost estimates for constructed works in the Report. Preparation will include coordinated review and consultation among stakeholders.

**Goal 2. Co-develop and support programs dedicated to understanding the upstream and downstream interactions.**

Objective 2a: Work cooperatively to eliminate or ameliorate the detrimental effects of those interactions on the Goat Canyon sub-watershed, the Tijuana River Watershed, and the estuary.

Tasks:

- Identify research projects underway; communicate with project leaders; offer support and collaboration; express the needs of the Tijuana River Estuary as it relates to the project; create a database of projects and make the data readily available.
- Pursue and implement cooperative projects with watershed stakeholders/residents to address the most pressing issues, among them sediment loads in Goat Canyon.

- Support companion projects in Mexico which might improve the Canyon de los Laureles environment.

Objective 2b: Apply integrated solutions that make use of the expertise and authority of multiple agencies and organizations.

Task:

- Actively seek out project partners and funding options; take advantage of stakeholder expertise and authority.

**Goal 3. Measure the success of projects and intervention through strategic cooperative monitoring and assessment.**

Tasks:

- Characterize existing monitoring carried out by U.S. EPA, San Diego Regional Water Quality Control Board, and other agencies.
- Develop monitoring methodology/plans.
- Collaborate with monitoring/research organizations to carry out plans and assess intervention effectiveness.
- Make use of the expertise and authority of agencies and organizations to accomplish this goal.

**Goal 4. Use and expand the education program developed at the Reserve to educate the general public and decision-makers on the U.S. and Mexican sides in an effort to gain support for future restoration efforts in Goat Canyon and other areas of the Reserve.**

Objective 4a: Encourage binational support among decision-makers for sustaining healthy coastal resources.

Tasks:

- Use the unique natural setting of the Tijuana River Estuary as a focal point for public education days (Watershed Day, etc.), school science projects, research exchange programs, public meetings, and events that involve the local community. Use the education program as a building block for these events.

- Encourage watershed stakeholders, U.S. and Mexican agency representatives, and decision-makers to visit and use the Reserve.
- Seek out opportunities to demonstrate the value and uniqueness of this local resource through public presentations, traveling exhibits, and other offerings.

**Goal 5. Establish closer linkages with sister National Estuarine Research Reserves, National Wildlife Refuges and other ecological reserves, particularly within our bioregion (Point Conception to San Quintin).**

Objective 5a: Establish greater exchange of information and methodology between Tijuana River NERR and counterpart agencies.

Tasks:

- Establish and improve personal contacts and regular communication with other Refuges and Reserves, placing particular emphasis on the Elkhorn Slough NERR and the Channel Islands Marine Sanctuary.
- Develop mechanisms to share ideas and information (on-line, newsletters, monthly conference calls, annual visits, etc.).

Objective 5b: Implement projects designed and developed by Tijuana River NERR and counterpart agencies

Tasks:

- Work jointly on projects that enhance communication and interaction.
- Investigate and cooperate on bioregional projects as needs dictate (bird monitoring, water quality, etc.).

**Goal 6. Maximize protection offered to the Reserve through national and international ecological and coastal special-area designation programs.**

**Tasks:**

- Use the watershed coordinator to explore the costs and benefits of these options, such as “RAMSAR” and “Man and the Biosphere.”
- Procure other staff time or volunteer time to explore these options.
- Move forward on the certification process, if advisable.

**Goal 7. Adequately fund and staff the watershed/binational coordination program.**

**Tasks:**

- Investigate sources of funding and secure funds.
- Investigate and propose funding levels needed for staff to carry out these tasks on a full-time basis.
- Investigate use of NGO staff or volunteers to help achieve the goals outlined in this chapter.

